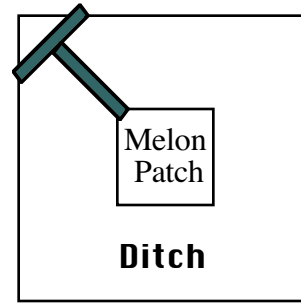


Solutions to Eight Problems

1. 9 cigarettes. First use the 28 butts to make 7 cigarettes. When the seven are smoked there are 7 more butts. Use 4 of them to make 1 cigarette. When that is smoked, add that butt to the other three to make the ninth cigarette.

2. See diagram. It is drawn to scale.



3. Work backward. See Table.

	Larry	Moe	Curly
Finish	40	40	40
Begin Game 3	80 L	20 W	20 W
Begin Game 2	40 W	10 W	70 L
Begin Game 1	20 W	65 L	35 W

4. It helps to find a pattern. See the table below. Only the perfect squares are left standing.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
All	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
2nd	U	D		D		D		D		D		D		D		D		D		D		D		D	
3rd	U		D			U			D			U			D			U			D			U	
4th	U			U				U				D				U				U				D	
5th	U				D					U					U					D					D
6th	U					D						U						D						U	
7th	U						D							U							U				
8th	U							D								D								D	
9th	U								U										U						
10th	U									D										U					
11th	U										D											U			
12th	U											D												U	
13th	U												D												
14th	U													D											
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17th	U																D								
18th	U																	D							
19th	U																		D						
20th	U																			D					
21st	U																				D				
22st	U																					D			
23rd	U																						D		
24th	U																							D	
25th	U																								U

This method is tedious. An analysis of the problem involves divisibility and factors. For every number – except perfect squares – there is an even number of factors. For example, the factors of 6 are pairs whose product is 6: 1 and 6, 2 and 3. Even primes have two factors. 7: 7 and 1. Perfect squares have an odd number of factors because one of the factors is repeated. 9: 1 and 9, 3 and 3. Thus, perfect squares will always finish sitting UP, whereas everyone else is sitting DOWN.

5. Give one of the boys the orange IN THE BOX.
6. If a hundred horses eat 100 tons, one horse eats one ton - IN 100 DAYS. Then ten horses eat 10 tons IN 100 DAYS. Thus ten horses eat only ONE TON in 10 days.
7. VI – II = IV (6 MINUS 2 = 4)
8. 9 games. If the man who won three games won three dollars in those three games. For the other man to have finished three dollars ahead, he would have to win three games to be even and then three more games to be ahead by three dollars.